EDITORIAL ARTICLES.

SCHEDE'S RESULTS WITH CORROSIVE SUBLIMATE AS AN ANTISEPTIC SURGICAL DRESSING AT THE HAMBURG GENERAL HOSPITAL.

It is now more than ten years since the warm recommendation of Listerism in its unmodified form, which came from the City Hospital at Munich, had such a decided effect in establishing antiseptic surgery in Germany. That hospital, which till then was in a most unsatisfactory sanitary condition and beset with numerous surgical diseases affecting wounds, was transformed, as it were by magic, into a model clinic by the adoption of the Listerian system, in which henceforth all wounds healed quickly and in the most desirable manner. This course was therefore speedily followed by other hospitals in Germany, and with very similar results.

But what the Munich City Hospital had done for the introduction of Listerism into Germany, the Hamburg Hospital has done for the use of corrosive sublimate as a surgical dressing, and the name of Max Schede, the director of the surgical clinic in that city, will always be associated with its introduction.

It is true, corrosive sublimate had been employed in surgery before its use was adopted in Hamburg.

In a paper read by Prof. Schede at the International Congress at Copenhagen last year, and which has quite recently appeared in pamphlet form in the *Sammlung klinischer Vorträge* of R. Volkmann,[1] the author mentions that von Bergmann had for some years previously used materials treated with mercuric bichloride for dressing wounds, and with good results. But the author himself had never used it, neither at Halle, where he first witnessed the immense revolution in

[1] No. 251, Ser. IX., Hft. 11. Feb. 12, 1885.

the treatment of wounds caused by Listerism, nor afterwards in Berlin, where, for a period of five years, he had charge of an extensive surgical department in the City Hospital. He was led to try the efficacy of corrosive sublimate by the unhealthy condition in which he found the Hamburg Hospital, and the insufficient results obtained in treating the wounds in the typical Listerian method. Although he never had known it to fail in his previous experience, he soon found that in Hamburg not only primary union was frequently not obtainable, but even the severer infectious diseases of wounds, erysipelas, septicæmia (with the exception alone of pyæmia), were not to be entirely excluded by this method. Accounting for these facts in the unsanitary surroundings—overcrowded, badly ventilated and insufficiently lighted rooms, with adjoining water-closets, in close proximity to an anatomical institute, and to the wards for infectious surgical diseases and malignant tumors in their advanced stages, etc.—he was led to seek some more potent and reliable method of securing a favorable course of healing of wounds.

At that time iodoform dressings were being warmly recommended. His experiences, however, with this material, he tells us, were anything but encouraging. Not only did erysipelas supervene with unexampled extensiveness and frequency, but several cases of typical embolic pyæmia occurred—a disease which he had not observed since the final adoption of Lister's method several years previously. This, added to the danger of iodoform poisoning, deterred the author from further experiments, and he turned his thoughts to corrosive sublimate, to which, at that time, attention had just been again called by R. Koch, of Berlin, as a most powerful disinfectant. The success of this modification of Lister's dressing has been reported three years ago by a former assistant of the author's, Dr. Kümmell;[1] but since then it has continued unabated, and has given the author good cause to be satisfied with it,—and in this monograph he gives in detail certain particulars which are of interest in the question of sublimate dressings.

Not only did all erysipelatous and other infectious diseases of wounds disappear on the same day that bichloride dressings were introduced.

[1] *Arch. f. klin. Chirg.*, Bd. 28, Hft. 3. *Annals of Anatomy and Surgery*, Vol. VIII., p. 87.

but all wounds, generally speaking, remained entirely free from irritation during the process of healing, and took an ideal course in every way.

The improved arrangement of the internal reorganization of the hospital also contributed to the successful treatment of wounds, and consisted for the most part in the isolation of all infectious diseases, and in giving to the assistant surgeons a greater scope and independence.

The technical details of the present manner of applying antiseptic precautions are as follows: A solution of 1 in 1,000 corrosive sublimate is used for disinfecting the hands of the operators, the skin of the patient, the sponges, and for such wounds as have existed before admission. The weaker solution of 1 in 5,000 is used for irrigation of fresh wounds during operation. In operating upon unhealthy surfaces, both solutions are used alternately for irrigation. The reason for not using the stronger solution altogether for irrigation consists in the danger of poisoning.

Turf-moss is generally used as a dressing, and is preferred to sand or ashes, and also to wood-wool, which is liable to pack and leave free interstices. This moss, having previously been picked over, is prepared by submersion in a solution of corrosive sublimate 1 in 500 for several hours, and is then wrung out and sewed, in a moist condition, into bags of sublimated gauze, so that cushions are formed, of about 2 centimetres in thickness, but differing in length and width, the largest being 54 by 70 centimetres.

Only enough of these cushions are made for use during the day, and they are kept in air-tight envelopes in a wooden box lined with glass plates. Dry cushions require to be wrung out in sublimate solution before use. Sublimated cotton and gauze are also used for certain purposes, and are made by immersion during a few minutes in a solution consisting of 1 part of corrosive sublimate, 10 parts of glycerine, and 190 parts of water.

Glass-wool is also extensively used, this being a conglomeration of finest spun glass threads, soft and pliable as silk; this is kept in a one-per-cent solution of sublimate till used.

Sublimated catgut is now prepared by winding the catgut tightly around thick wooden spools, and placing them from six to twelve

hours, according to thickness, in a one-pro-mille solution of mercuric bichloride, and afterwards keeping it in absolute alcohol.

The dressings are applied in the following manner:

After closing the wound with sutures, a thin layer of moist glass-wool is covered over it, upon which the moss bags are laid, varying in size and number according to circumstances, the object being to adapt the surfaces of the wound to be united, exactly, and to exercise a pressure upon it. For this latter purpose, bandages cut from sublimated gauze are often used between each cushion. The whole is then finally enveloped in one large cushion, which is securely fastened in its place by simple gauze bandages, to which a moistened starched bandage is added.

Open wounds are either packed with sublimated crushed gauze—or even filled with sublimated sand,—or simply covered with a two or four-fold layer of sublimated gauze, and then bound up with the cushions.

The characteristic feature of all these dressings lies in the fact that they are dry, and favor the exsiccation of the wound. Nowhere is any use made of oil-silk, mackintosh, or guttapercha tissue. The author, indeed, is of opinion that the addition of an impermeable structure, far from enabling the surgeon to leave the dressings on longer, has the contrary effect, not only preventing the evaporation of the secretions as well as the transpiration, but directly increasing the secretions from the wound by keeping it warm and moist. The moss covering, on the other hand, assists evaporation by causing every drop secreted to spread over a comparatively large surface. The secretions thus become inspissated, and the dressings of the larger wounds consequently remain dry for a longer period of time, while the smaller wounds soon cease to discharge, and heal under the coagulum formed by the dried-up exudates. He believes that the use of protective retards primary union, and also increases the liability of infection by keeping the thin layer of substance between the edges of the sutured wounds moist.

The action of the glass-wool is peculiarly efficient by virtue of its capillary suction-power, rapidly distributing each drop of serous secretion to the moss, and thus causing the discharge to cease by drying it up. The wool then forms a compact crust upon the wound, acting

mechanically as a protection to it, and serving as a defense against infection from without.

The author makes free use of rubber drainage tubes, which he prefers to all others, and generally removes them altogether at the first change of dressings on the seventh day, unless any traces of suppuration are to be found in them.

The general course of the healing process is always the same: reaction of any kind may be absent, or an "aseptic" fever may set in, reaching its highest elevation on the second day and disappearing on the third; it may rise as high as 39° C.

As to the treatment of infected wounds with corrosive sublimate, the author is in the habit of disinfecting large wounds and suppurating cavities (sacs and empyema) with a solution of mercuric bichloride, 1 in 1,000, and prefers its use to carbolic acid both on account of its efficiency and in regard to the dangers of poisoning.

The severer infectious diseases of wounds, as diphtheritic inflammation and hospital gangrene, may frequently be dressed with advantage with stronger solutions—as 1 per cent. The poisoning that ensued in the only case of the author's, he regards as comparatively harmless.

Compresses, moistened with a one-pro-mille solution of bichloride and covered with rubber tissue, are extensively used at the Hamburg Hospital for covering all unclean, infected or inflamed wounds, and on contused wounds where extensive sloughing is expected, as well as on wounds which are exposed to contamination from fæcal matter, and in all chronic granulating surfaces and fistules, especially in tuberculous affections, for which the author regards corrosive sublimate as a specific.

All these latter uses of the antiseptic, including the cases where certain amounts of the liquid were allowed to remain in cavities of the body, or when the one-pro-mille solution was used for a very great length of time during an operation on anæmic subjects or in serous cavities,—the author considers not free from the danger of poisoning with which subject he concludes the memoir—although he never had but one occasion to observe intoxications of any great severity, such as have for instance been published by obstetricians. This one case was that of an aged, anæmic and cachectic patient who had been operated for cancer of the breast, and who had suffered from slight

stomatitis, diarrhœa and tenesmus after the operation, and had recovered; on the seventh day, however, the wound was again dressed and irrigated with the one-in-thousand solution; immediately after which the symptoms reappeared and the patient died—nine days later, although the dressings were speedily removed.

Regarding a series of cases (8) treated with sublimate-compresses for septic diseases, which had presented no symptoms of poisoning during life, but which showed morbid intestinal changes very similar to those found in cases of mercuric poisoning after death (consisting of catarrh and superficial ulceration of the mucous lining of the rectum, reaching as far up as the ileum; croupous exudates and diphtheritic membranes with injection and thickening of the mucous membrane), the author is in doubt whether to class them simply as septic intestinal disease or as intoxicants, and adduces a number of similar cases (4) where the post-mortem revealed the same conditions, but which never had been treated with mercury.

He believes septic diseases and diphtheria tend to affect the digestive tract, and that the use of corrosive sublimate as a surgical dressing may increase this tendency. Clinical symptoms of mercuric poisoning, tenesmus, mucous and bloody dejecta, were not present in any of these cases.

As a final result of his experiences, the author asserts that whoever makes use of corrosive sublimate as a surgical dressing with the necessary precautions, will find it not only the most reliable and efficient disinfectant, but one that will promote the rapid healing of wounds more than any other, and is at the same time more free from disagreeable or dangerous secondary effects than any other.

Appended is a survey of the results of nearly 1,300 operations performed at the Hamburg Clinic for the thirty months during which corrosive sublimate was used, and ending the 1st August, 1884.

W. Van Arsdale.